State of Ohio,)
County of Lorain.) SS:

IN THE COURT OF COMMON PLEAS

HUBERT PORTER, ADMINISTRATOR of)
the ESTATE of BRAD PORTER,)
DECEASED,)
Plaintiff,)
vs.) Case No.
) 96 CV 1156 89
)
MANHAL A. GHANMA, M.D., et al.,)
Defendants.)

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THE DEPOSITION OF RANDALL E. MARCUS, M.D.
WEDNESDAY, JULY 14, 1999

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The deposition of RANDALL E. MARCUS, M.D., called by the Plaintiff for examination pursuant to the Ohio Rules of Civil Procedure, taken before me, the undersigned, Robert J. Wanous, Notary Public within and for the State of Ohio, taken at the University Hospitals of Cleveland, 11100 Euclid Avenue, Cleveland, Ohio, commencing at 2:10 p.m., the day and date above set forth.

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APPEARANCES:

On behalf of the Plaintiff:

Justin F. Madden, Esq.
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2400 National City Center
Cleveland, Ohio 44114

On behalf of the Defendant Dr. Ghanma:

John D. Travis, Esq.
Gallagher, Sharp, Fulton & Norman
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Cleveland, Ohio 44115

On behalf of the Defendant Dr. Quansah:

Dennis R. Fogarty, Esq.
Weston, Hurd, Fallon, Paisley & Howley
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On behalf of the Defendant Lorain Community:

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DEPOSITION INDEX
RANDALL E. MARCUS, M.D.

RANDALL A. MARCUS, **M.D.**

of lawful age, called by the Plaintiff for examination, pursuant to the Ohio Rules of Civil Procedure, having been first duly sworn, as hereinafter certified, was examined and testified as follows:

EXAMINATION **OF** RANDALL E. MARCUS, M.D.

BY MR. MADDEN:

Q Good afternoon, sir. Would you do us the formality of stating your full name, please.

A Randall Evan Marcus.

Q What do you do for a living, sir?

A I am an orthopedic surgeon.

Q Dr. Marcus, I am Justin Madden and you and **I** just met before the deposition. Thank you for your time this afternoon. This is our opportunity, in representing the estate of Brad Porter, to take a discovery deposition from you and ascertain what it is that you have by way of opinions and testimony in this case.

Now, I am going to have a number of questions, and if some of them don't make sense, they may not, please point that out so I can make sure when you answer you do understand a question clearly. Is that fair?

A Yes.
Q Doctor, what is your professional address?
A Department of Orthopedic Surgery, Case Western Reserve University School of Medicine, University Hospitals, 11100 Euclid Avenue, Cleveland, Ohio 44106.
Q And you have a copy of your curriculum vitae. Is that a current copy?
A As of February, 1999, it is.
Q Can we go ahead and mark that copy, sir?
A Yes.
Q Okay.
[Deposition Exhibit 1 was marked.]
Q Handing you what has been marked Plaintiff's Exhibit 1, Doctor, can you identify this as a current curriculum vitae as of February of this year?
A Correct, yes.
Q Can you tell by looking through it if there are any articles, honors, societies that you currently have or know of that do not appear in Plaintiff's Exhibit 1?
A I have given some talks since February, 1999, that are not in here yet. And I may have published a paper. I will have to check, that

hasn't been in here.

Q The talks -- or the paper that you have referenced, Doctor, do you recall if the subject of any of those talks or papers dealt with treating trauma patients?

A They would definitely, they would most likely deal with treating trauma patients.

Q All right. If you would be kind enough to let Mr. Travis know if you have any copies of the articles or if you have the title and location of the presentations. We would all be interested in seeing what those entail.

Doctor, let me take a minute to look through here. You are board certified in what medical speciality, sir?

A Orthopedic surgery.

Q There is no board certification for trauma surgery; is that correct?

A Within orthopedic surgery?

Q Well, is there a certification, a board certification in trauma surgery, just as a speciality?

A Not that I know of.

Q Okay. Do you have experience or training in handling trauma patients?

A Yes.
Q Okay. Can you tell me a little bit about that?
A Well, a large part of orthopedic surgery is the treatment of traumatic injuries, meaning, somewhat redundant, but fractures and injuries that occur because of traumatic problems. Part of our training is in trauma and my subspeciality, one of my subspeciality areas, is in the area of trauma.
Q Okay. As far as the subspeciality, did you attain any course or receive any type of certification for that subspeciality?
A Yes. I did three fellowships after I finished my orthopedic surgical residency here at Case Western Reserve in orthopedic trauma.
Q All right. A patient such as Brad Porter, presenting with the symptoms with which he presented back on July 13th, is that a patient that you would typically handle in your professional practice?
A Yes. I didn't quite finish answering the question before that, Justin.
Q Go ahead, I am sorry.
A Sorry. I have also been elected into the Orthopedic Trauma Association.

Q Thanks for pointing that out.

MR. TRAVIS: Are you done now? You were going to say something.

THE WITNESS: Yes. Well, I believe Justin's question was subspecialization in trauma.

MR. TRAVIS: Yes.

THE WITNESS: And I was elected to the Orthopedic Trauma Association in 1986. And I was elected into the Societe Internationale De Chirurgie Orthopaedique Et De Traumatologie, which is called SICOT, which is the International Trauma Association, in 1991. Again, both of those organizations are not things you apply for until you are elected into, based on your trauma credentials. I have also published quite a few papers, as you can see.

Now, your next question is what?

Q My next question was: A patient such as Brad Porter, if he presented to this hospital, is he a patient that you would typically treat in your professional practice?

A Yes.

Q Okay. A large part of your practice is in the elective surgeries of prosthetic devices for

knees and hips; is that true?

A That's true.

Q And can you quantify, in terms of percentage, what part of your practice is devoted to that elective surgery, as opposed to trauma patient care?

A Yes, to some extent. As you know, trauma patient care is sort of unscheduled care. So those of us who deal in trauma all have other subspecialties that we do our elective surgery in. My elective surgery is in lower extremity problems, as you mentioned, Justin, surgery of the hip, surgery of the knee, surgery of the foot and ankle as well. I would say probably most of my elective time is, my scheduled time, is taken up with elective surgeries, such as reconstructive problems, which would include reconstruction following severe trauma. Acute trauma injuries probably only taking maybe 20 percent of my time. Those tend to be emergency type problems that I would handle, either because of I am on call, or one of my associates who is on call has a specific trauma problem in the lower extremities that he might refer to me.

Q Okay. So I think what you are telling me, and

if I misstate this, point this out, about 80 percent of your professional practice is devoted to elective surgeries, perhaps 20 percent, although I am sure it fluctuates because it is unpredictable, deals with trauma patients?

A That is correct. Probably more trauma in the summer than in the winter.

Q Okay. And you are also on the faculty here at Case Western?

A I am.

Q What percentage of your time is devoted to teaching or can you tell me a little bit about your faculty responsibilities?

A I am a professor of orthopedics at Case Western Reserve University Medical School. So I am constantly teaching. I have residents assigned to my service. Most of my teaching is in the post doctoral area, meaning people that have already received their medical degree that are becoming orthopedic surgeons. So you might say I am always teaching to some extent, because I have a resident with me. I am probably asked to give one to two lectures to the undergraduate medical students per year.

MR. MADDEN: Okay. Let's go

off the record.

[Discussion had off the record.]

Q Go ahead back on.

Dr. Marcus, I was looking through the list of publications in your CV. Are there any publications, to your memory, and please feel free to look through these, that you feel deal with the kind of subject matter that we have in this particular patient's case?

A Justin, that is a tough question to answer. As you know, most of them have to do with trauma and this is a traumatic case. None of them that I recall have anything to do with liver lacerations, or specifically they are all from an orthopedic point of view.

Q All right. So we are dealing more, in your published articles, you are really talking about traumatic injuries resulting in broken bones or fractures?

A For the most part. There is a paper that was published in the Journal of Bone and Joint Surgery on multiple injury in children, that might have something to do with this. And I have a textbook that I edited on the multiply injured child. But again most of these papers

are from the point of view, the orthopedic point of view.

Q All right. The presentation in the article that you mentioned does not appear in here. Do either of those, to your memory, deal with any sort of trauma discussion to the abdominal area?

A No.

Q Let me go ahead and ask you about how you are being compensated for your professional time in this case, break it down for me?

A Yes. Our group charges per hour of time, regardless of what we are doing, whether it is depositions or reviewing records. It is $500 per hour.

Q All right. And the same is true with trial testimony?

A Exactly.

Q Is it your intention to testify live at the trial, if this matter goes that far?

A If it can be worked into my schedule.

Q Have you served as an expert in cases such as this, not as a treating physician but as a liability expert in the past?

A A case such as this?

Q Well, let me rephrase that. Putting aside,

putting aside testifying as a treating physician in the damage portion of a case, have you testified before as an expert on the issue of liability, either on behalf of the patient or on behalf of a defendant doctor?

A Yes.

Q How many times in total?

A Testify in court?

Q Serving as an expert.

A Oh, in my career, a lot of times.

Q I know it is not something everybody keeps track of.

A Right.

Q But 15, 25 times as a liability expert?

A Yes, I would say that.

Q And that is over the course of your career?

A Right. There are some years that I haven't reviewed or testified at all and other years I will have a couple of cases.

Q In your service as an expert on the issue of whether a doctor met or violated the standard of care, have you ever testified on behalf of a plaintiff against a physician?

A Yes.

Q Of the 25 times or so that we talked about, what

percentage or how many times for a plaintiff?

MR. TRAVIS: Objection. The numbers are 15 or 25. You can answer, Doctor.

A Yes. I do not keep track of those numbers. But if testifying means reviewing cases, I would say over -- I have been in practice since 1981, it is probably more than 25 times. But I would say as an estimate, that probably two-thirds of the cases that I review are for defending the physician and probably one-third for the plaintiff, the patient.

Q Okay. I appreciate that.

And if the case moves beyond the reviewing stage and you actually give a deposition or testify in trial, is it about the same breakdown, two-thirds for the defendant, one-third for the plaintiff?

A I would say roughly, yes, that probably makes sense. That would be true.

Q Okay. So understanding that you have reviewed a lot of cases, some of which may not really be involved later in a deposition or a trial, when you said 15 to 25 cases you are referencing where you have actually given a deposition or testified in court, is that fair?

A Yes, I would say at least that. Right.
Q Have you ever worked with Mr. Travis on a case before?
A No.
Q All right. Originally you were retained by the Jacobson Law Firm and Don Switzer?
A Yes, I believe that is true.
Q How many cases did you have with the law firm of Jacobson-Maynard in regard to your recollection?
A I don't know the exact number, but I reviewed a number of cases, a lot of cases for them, I would say.
Q All right. And would they have comprised the bulk of your involvement in the cases where you actually gave a deposition or testified in trial for the defendant?
A I don't know. A number of cases that I reviewed for them and for other attorneys, I guess I would come up with answers they didn't like, so I would never hear from them again.
Q In the cases where you have actually testified in a deposition or at trial and you were serving as a liability expert for the plaintiff, those were cases where you would have said some physician or some medical provider failed to

meet a standard of care, is that fair?

A There were cases like that, yes.

Q And in those cases, did any of them involve trauma care, patients who had a blunt trauma of some type and you felt the physicians did not meet the standard of care?

A Justin, when you say blunt trauma, you mean like blunt trauma to the abdomen?

Q Let's go with that.

A As opposed to the bones.

Q Let's just say specifically with blunt trauma to the abdomen?

A I don't recall any of them having anything to do with blunt trauma to the abdomen.

Q Okay. Now, you had indicated you and Mr. Travis is met about ten days ago to schedule your deposition and so forth. What comprises your file, if I might look through it for a moment?

A Yes. The important part of my file is here. I also have with me the autopsy information. What I did not bring are all the depositions and all the expert reports that Mr. Travis has provided me with.

Q Okay. And I understand why, there is a lot.

A It is a whole carton full.

Q In your report, you have actually broken down for us -- well, before I get there -- you have written a report in this case, correct?

A Yes.

Q A report dated July 7th '97?

A Yes.

Q Had you written any reports to Mr. Switzer prior to that date?

MR. TRAVIS: On this case?

MR. MADDEN: Yes, sir.

A Not -- no.

Q Have you written any sort of follow-up report or have you had any communication with Mr. Travis regarding your opinions in this case with respect to written communication?

A I have had no written communication regarding any reports with him.

Q So what we have dated July 7th '97 is the only report outlining your opinions concerning this case?

A That's correct.

Q Now, you have broken down that you have reviewed the following, and that includes the medical records for Mr. Porter, autopsy photographs, deposition transcripts of Drs. Ghanma, Salka,

Quansah, Onyekwere, Mr. Porter, Mrs. Porter, medical reports from Dr. Shapiro and Klein, the report from the Ohio Division of Watercraft boating accident, the medical report of Dr. Bonnell and the medical records of Dr. Ghanma?

A Right.

Q To your knowledge, have you reviewed anything else that doesn't appear in this particular summary?

A Yes. As you can see, that report was written to Mr. Switzer in July of 1997. And I didn't hear anything more about this case until 1999, when I believe, when Mr. Travis called me to tell me that he was now involved in the case and wanted to know if I would be willing to continue in the case and work to review materials from him. And so I said yes. And I have since reviewed more materials.

Q Can you tell me what additional materials you have reviewed?

A Yes. If you can give me back my report.

Q Yes, sure. Absolutely.

MR. TRAVIS: Off the record.

[Discussion had off the record.]

A Back on the record. I have reviewed -- may I

just tell you everything that I have reviewed.

Q Yes, please.

A Rather than go back and forth. The Lorain Community St. Joseph Regional Health Center admission 7-13-95 to 7-15-95. The Division of Watercraft boating accident report, deposition of Mr. Porter and Mrs. Porter, deposition of Mark Shapiro. Expert reports of Mark Shapiro and E.F. Klein. Deposition of Dr. Ghanma, Dr. Quansah, Dr. Salka, Dr. Onyekwere, and Dr. O'Day. Deposition of Dr. Bonnell, defense expert reports of Dr. Bonnell, Dr. McAuley, Dr. Kirkwood, Dr. Sydulka, Dr. Zumwalt, Dr. Raab, Dr. Hershman, Dr. Hoffman. Autopsy report and photographs. Death certificate. Pictures of anesthesia equipment. To my knowledge, that is all.

MR. TRAVIS: And the recent depositions.

A Yes. Hold on. Off the record.

Yes, I got it. I also reviewed depositions of Dr. McAuley, Dr. Zumwalt, and Dr. Bonnell.

MR. TRAVIS: You said Bonnell. Matus is currently, the most recent

one.

THE WITNESS: And Matus and Daniels.

Q And you are aware that Dr. Ghanma has been deposed twice? He had a supplemental deposition about a year after his first one. I just wanted to make sure you have seen that.

A Yes, I believe I saw that.

Q All right. Are you all set?

A All set.

Q So we have a number of rather thick documents that you have reviewed. They are not here, but we know what they are and that is good.

Now, I also have in front of me the photographs from the autopsy, correct?

A And the autopsy report, I believe.

Q And the autopsy report follows. Why don't you just go ahead and tell me what that packet entails?

A This is a packet that was given to me by Mr. Travis. It is autopsy photographs,

MR. TRAVIS: If I can interrupt, these are just deposition exhibits from the coroner's deposition.

A That is exactly what they are.

Q All right. Have you reviewed any medical literature in coming to your opinions in this case, any specific articles, journals?

A No.

Q You regularly read medical literature, I would assume?

A Yes.

Q What sorts of literature do you receive and review on a regular basis?

A I read the Journal of Bone and Joint Surgery. I read the journal of the American Academy of Orthopedic Surgeons. I read the journal of the Orthopedic Trauma Association. Clinical Orthopedics and related research, regularly

Q Have you personally spoken with any physician or nurse or medical provider who was involved in treating Mr. Porter?

A No. I haven't

Q To the extent that you have had any contact in this case, I assume it is either from Mr. Switzer and his office or Mr. Mraw is and his office; is that fair?

A Correct.

Q Do you have any information, you can t ink of, in this case, that was not part of your file or

provided to you either by Mr. Switzer or by Mr. Travis?

A None.

Q Now, I want to cover a few areas. And if there is something to talk about, fine, but I think we are going to be moving towards the second debridement surgery.

Let me ask you, first of all, you are aware from reading the watercraft division report the basic facts surrounding Mr. Porter's incident in Lake Erie on July 13th?

A Yes.

Q And you are aware that there were some rescue efforts made by professionals and laypersons in getting him from Lake Erie over to the hospital? Do you have any criticisms of anybody involved in providing rescue care?

A No.

Q Dr. Ghanma testified that he believed the liver laceration, the abdominal injuries, were sustained while Mr. Porter was in Lake Erie. Do you agree with that?

MR. TRAVIS: Objection. I would like you to refer to particularly where Dr. Ghanma said that.

Q Let me ask you as a general proposition, do you have an opinion where Mr. Porter may have sustained his liver laceration?

A Yes.

Q And where is that, sir?

A In the operating room.

Q Okay. Do you believe that Mr. Porter sustained any abdominal injuries while he was in Lake Erie and prior to arriving at the hospital?

A I have an opinion, yes.

Q Okay. What is the opinion?

A That he did not sustain any significant injuries to his abdomen, intraabdominal organs, while in Lake Erie.

Q Can you tell me what your understanding is of Mr. Porter's episode in Lake Erie prior to coming to the hospital?

A To the best of my recollection, he was involved in a storm that caused his boat to sink. And in an attempt to rescue Mr. Porter and his passenger, he was struck on the posterior thigh by the propeller of the rescue boat. His passenger got into the rescue boat. He refused rescue at the time because he wanted his boat towed. And at a later time he was pulled out of

the water by a jet skier and then brought to Lorain Community Hospital.

Q All right. Now, earlier you had mentioned you believe the liver laceration occurred in the operating room. And I am assuming that is during the second debridement surgery and not the first?

A During the attempts to resuscitate him following the second debridement operation.

Q That would have been approximately sometime after 10:00 a.m., July 15th of that year?

A Correct.

Q Do you have any criticisms of any of the personnel in the emergency room where Mr. Porter first presented?

A No.

Q Do you have any criticisms of any of the medical professionals who were involved in Mr. Porter's first debridement surgery?

A No.

Q Do you have an opinion -- well, strike that. Are you critical of Mr. Porter in any way, either not being an accurate historian, failing to adequately describe his symptoms or anything along those lines?

A No.

Q Do you have any criticisms of the nurses who were caring for Mr. Porter in the hospital, in terms of their providing information to Mr. Ghanma and the other physicians involved in his care?

A No.

Q You have read and seen the photographs from the coroner's report?

A Yes.

Q Do you disagree with any of the conclusions that the coroners came to in that report?

A Yes.

Q Okay. Can you tell me what disagreements you have?

MR. TRAVIS: I object. Because he doesn't have the report before him. But to the best of your ability, you can testify from your memory, Doctor.

Q And before you answer, I have absolutely no problem with you getting the report in front of you, if you want to review it. It is not a test of memory. It has certainly been a number of years.

A Off the record.

[Discussion had off the record.]

A Back on the record. Mr. Madden asked me if I disagreed with the findings of the coroner's report dated 10 August, 1995. And I said I did. The coroner, Dr. Paul Matus, determined the cause of death, a blunt impact to the abdomen with laceration of liver and hemoperitoneum. And I disagree with that.

Q Okay. Now, I am going to eventually ask you about your opinions on cause of death. But I just wanted to identify the areas of the coroner's report with which you disagree. Are there any other conclusions that he has come to or findings that he has made with which you disagree?

A I disagree with the toxicology report. It said that the drug screen only showed Lidocaine and metabolites. Methylprednisolone. I don't believe there are any other findings in the final report.

Q Okay. Why don't we go ahead and touch on the toxicology matter that you have disagreement with. Tell me why you disagree with those findings?

A Well, in reviewing the records, it is my

impression this patient was given narcotics while in the hospital during the previous 24 hours prior to this report. And I am at a loss to understand why a drug screen wouldn't have shown Demerol, Valium, Codeine that the patient we know was given, based on the hospital records.

Q Is there any significance then, in your mind, on that point, in other words, what conclusion do you come to that the toxicology screen doesn't show that?

A That the toxicology screen is not accurate.

Q Okay. All right. Now, Dr. Ghanma's first contact with this patient was in the emergency room on July 13th?

A As best I can remember, I believe that is true.

Q Okay. What, to your recollection, did Dr. Ghanma do with respect to that patient when he first saw him?

A I believe, from my memory, he took a history and physical and performed a physical exam.

Q Let's go ahead and make an outline. We know that Dr. Ghanma saw the patient in the emergency room on the evening of July 13th. We know that a second contact would have been the first

debridement procedure at about 20 minutes past midnight on the morning of July 14th. He has testified that he saw the patient about 7:40 in the morning on July 14th. We know that he saw him around the dinner hour on the same date. And then we know that he saw the patient for the second debridement procedure on the morning of the 15th.

Have I left anything out, as far as you remember?

A I believe that is correct

Q I am just going to go through them at each point and discuss Dr. Ghanma's involvement and what your impressions were of it. The chart does not reflect when Dr. Ghanma saw the patient in the emergency room, that the doctor examined the abdomen. Do you remember that?

A There is nothing in the chart that reflects that, correct.

Q And you and I can agree that one of the reasons why we chart in a patient's record as to what the doctor does is to make a record of their activity and treatment, true?

A Correct.

Q And if something doesn't appear in the chart, it

can be a fair inference that perhaps something wasn't done, is that fair?

MR. TRAVIS: Objection. You can answer, if you can.

A I don't know how to answer that. I believe that for accuracy, as you do, Mr. Madden, that if you perform an exam the best way to document that you performed it is to document it in the chart.

Q Are you aware of any indications of the patient having been either injured by lacerations or contusions when he presented at the emergency room, injuries that he suffered while in the lake?

A Yes. He had a severe laceration to his posterior thigh, measuring approximately 12 inches in length. He had a laceration, I believe, on his thumb. He had, I believe, a nondisplaced fracture of the fibula.

Q To your memory, were there any signs of bruising or injury to the abdominal area in the right lower quadrant?

A None -- I don't recall any significant external signs of injury to the abdomen.

Q Is it a fair statement that with blunt abdominal injuries you may sometimes have injuries to the

internal organs with no exterior indication, bruising or something of that nature?

A That is certainly possible.

Q Dr. Ghanma's first contact with the patient in the emergency room, was there anything that you felt was not done appropriately or adequately in that visit?

A I have no criticisms of that visit.

Q If Mr. Porter had been brought to this hospital, would an orthopedic surgeon have been called to serve as his attending physician?

A I believe so.

Q Why is that?

A Because this patient had essentially a unisystem injury to his extremity, his laceration. And at this hospital lacerations to the extremities are handled by orthopedic surgery.

Q Could they also be handled by a trauma surgeon?

A At another hospital?

Q At this hospital?

A That's possible.

Q Could a plastic surgeon handle the debridement procedures that were performed on Mr. Porter?

A I believe so.

Q Okay. Was there any reason why it was more

beneficial to Mr. Porter to have an orthopedic surgeon perform those surgeries as opposed to a different specialist?

A If he were at this hospital?

Q Yes.

A Yes. I believe that orthopedic surgeons are probably the most familiar with the anatomy and the care of traumatic injuries to the musculoskeletal system, particularly in the extremities.

Q To your knowledge, was a trauma surgeon consult ever entertained when Mr. Porter was seen in the emergency room?

A At Lorain Hospital?

Q Yes.

A No.

Q Okay. Should a trauma surgeon have been brought in?

A I don't believe so.

Q Why is that?

A Because I believe this was not a multiple trauma situation. And I believe it was a unisystem injury, meaning the primary injury was to the left lower extremity, or I can't remember which lower extremity, to the lower extremity. And

there were not -- this was not a multi-trauma situation.

Q Okay. Now, I am not being smart with you, but one of the reasons that you feel this was not a multi-trauma situation is because you believe the liver laceration occurred in the operating room on July 15th?

A Correct.

Q Okay. Now, I want you to assume that Dr. Ghanma believed that there was an abdominal injury that occurred while Mr. Porter was in Lake Erie. If he had that knowledge in the emergency room on July 13th, should he have made a trauma surgeon consult?

MR. TRAVIS: Objection to the hypothetical. You can answer, if you can.

A Yes.

Q And if he failed to do that, would you be critical of his decision not to make such a consult?

A Yes.

Q Would that have been a violation of the standard of care, in your opinion?

MR. TRAVIS: Objection. That is not a question.

A What is the question?

Q If he had failed, if he had that knowledge and failed to have a trauma surgeon consult, would that be a violation of the standard of care, in your opinion?

MR. TRAVIS: I am going to object, unless you explain the nature of the abdominal injury and be more specific in your hypothetical.

Q You can answer, if you understand it.

A As I understand it, if the patient had a liver laceration, and if he had signs of intraabdominal trauma, would I -- and no general surgical or a surgeon with abdominal expertise was not called, would I be critical, do I feel it would fall below the standard of care? Yes.

Q To your knowledge, was a CT scan ordered in the emergency room?

A No.

Q Should there have been one ordered?

A No.

Q And again, that is based on your belief that the laceration of the liver occurred in the operating room?

A Yes. And the fact that his abdominal exam was

benign in the emergency room.

Q What was the abdominal exam and what did it show in the emergency room?

A I believe it was normal.

Q What did Dr. Ghanma do? It is my understanding he listened with the stethoscope and he palpated the area. That is what he testified to.

A And that is certainly sufficient. In addition to the fact that he was examined by the emergency room doctor and was examined by the primary care physician, who did the history and physical. All finding the abdomen to be within normal limits.

Q The next time Dr. Ghanma saw the patient was approximately -- well, it was in the first debridement procedure. Can you tell me or summarize for me what you believe took place at that time?

A Yes. They brought the patient to the operating room, placed the patient in the prone position and did a debridement of the posterior thigh wound.

Q The patient went through the procedure just fine, as I recall?

A I agree.

Q The anesthesiologist in the first procedure was not the same anesthesiologist as the second procedure, true?

A I don't recall.

Q I mean, I am going to represent that unless anybody thinks I am wrong, I don't think Dr. Quansah was involved in the first anesthetic procedure.

Did the patient have any difficulty in that procedure, as far as you can recall?

A Not that I know of.

Q Then Dr. Ghanma saw the patient at 7:40 in the morning on July 14th?

A I believe so.

Q Do you recall what took place in that visit?

A I believe he examined the patient.

Q Was there any finding of any significance at that time?

A Not that I know of.

Q At some point do you recall Mr. Porter complaining to Dr. Ghanma about pain in the right lower quadrant?

A Right lower quadrant?

Q The abdominal area?

A I don't recall that.

MR. MADDEN: Off the record one second.

[Discussion had off the record.]

Q Doctor, I may have asked an unclear question, so let me go back. Do you recall testimony in this case from Dr. Ghanma, that Mr. Porter complained to him of pain in the right lower chest on July 14th, the day following the incident?

A Yes.

Q Okay. Can you tell me what you recall about that?

A The doctors said that -- asked the patient if he was having any abdominal pain and any loss of appetite. The patient apparently noted some loss of appetite and complained of pain in the right lower chest, not the right lower quadrant.

Q Okay. And I was inaccurate in saying quadrant. Now, this complaint of pain occurred before the second operating room procedure, where the liver laceration occurred, in your opinion, correct?

A Yes.

Q Okay. Is this complaint of pain in the right lower chest significant to you in any way?

A Only to the point that he verbalized it to the physician and the physician then had the

opportunity to examine the patient to determine if it were a significant injury.

Q Given this complaint from the patient, should Dr. Ghanma have ordered a trauma surgery consult?

A No.

Q And that is your opinion to a reasonable degree of medical probability, correct?

A Correct. The surgeon's responsibility was to take a history and perform a physical and based on those findings decide as to whether further consultation or laboratory studies need to be carried out.

Q And along those lines, should Dr. Ghanma, in your opinion, have ordered a CT scan, given this complaint from the patient?

A No.

Q And for the same reasons?

A Correct.

Q Was there anything else that you can recall about Dr. Ghanma's visit with the patient on the morning of July 14th, that we haven't discussed?

A No.

Q His next visit with the patient then was on the evening of July 14th, correct?

A Correct.
Q Do you recall that the doctor had ordered a second CBC sometime in the morning of July 14th and had the results by that time?
A Yes.
Q Do you recall what the results of that CBC were?
A I can't give you the exact number but it showed a decreased hematocrit and hemoglobin.
Q What is the significance of a decreased hematocrit and hemoglobin, bleeding? Internal bleeding?
A No.
Q Not necessarily internal?
A Bleeding, internal or external.
Q Do you have any memory whether the results of the H&H were specific in any way? Were they severe?
A I believe they were consistent with the laceration that the patient had sustained and the blood loss that would be due to that laceration.
Q Do you have any opinions as to the amount of blood that Mr. Porter lost by this point?
MR. TRAVIS: At the time of the second CBC?

Q Well, let's say by the evening of July 14th, what the blood loss would have been?

A As I recall, his hematocrit had dropped from 45 or so in the emergency room and I believe, correct me if I am wrong, that on the evening of the 14th the hematocrit was 38, 35, something like that.

Q We can always confirm that if you want.

A 45.1 to 38.2. So the hematocrit had dropped approximately 7 points, which would be consistent with a severe laceration such as that.

Q Do you recall what the situation was with Mr. Porter's blood pressure, if there was a trend from the time he presented to the emergency room through the evening of July 14th, was it up or down, hypotensive?

A I don't recall the exact numbers, but I believe his blood pressure had a trend, from the time he was admitted until practically his cardiac arrest, that the trend was down.

Q With the falling H&H and a falling blood pressure over that course of time, in your opinion should Dr. Ghanma have considered an internal bleed?

A I certainly believe he should have considered the whole patient. Maybe I take issue with the way you asked the question. Any physician would consider bleeding from any source. He has got to figure out why the patient has a hematocrit that moves from 45 to 38.

Q Well, was it appropriate for Dr. Ghanma to presume that it all be attributed to the leg laceration?

A I believe so.

Q With a patient's complaint of a pain in the right lower chest, with a history that the patient had had a pretty rough episode in the lake with bouncing or contact, what have you, with the falling H&H and the falling blood pressure, should an internal bleed have been part of Dr. Ghanma's thinking by the evening of July 14th?

A I believe it certainly would be part of his thinking. To the extent that he asked the patient if there were any complaints, he would examine the patient and then draw conclusions based on what he found.

Q Again, with those considerations in mind, was the CT scan warranted by the evening of July

14th?

MR. **TRAVIS:** Objection; asked and answered. You can answer again.

A Not if the abdominal exam was not consistent with significant intraabdominal injury.

Q **Is** there anything else that **you** can recall about Dr. Ghanma's visit with the patient on the evening of July 14th that is significant to your opinions in any way?

A Nothing.

Q This brings us then to the second debridement procedure on July 15th. Was that surgery necessary at that time?

A Yes.

Q Why is that?

A **I** believe the patient had a significant injury that was -- had extremely high risk for infection. And I believe the patient was showing signs of sepsis.

Q Tell me, first of all, what is your belief as to why the patient was showing signs of sepsis by that point?

A An elevated temperature, he had a falling blood pressure, and he had a highly contaminated wound in his thigh.

Q Was a third CBC indicated, given falling H&H and his conversation with the patient on the evening of July 14th?

A Third CBC at what point?

Q By the morning of July 15th. In other words, prior to the second debridement surgery?

A I don't believe it was indicated unless the surgeon or any other physician felt the need for it. Personally, I don't think it was indicated.

Q If a third CBC had been performed early in the morning of July 15th, with the other conditions as we know them, what do you believe that CBC would have shown?

MR. TRAVIS: Objection. Are you saying conditions as we know them in retrospect at that time? Can you be more specific.

Q If you understand, fine, if not, I will rephrase it.

A I believe that a third CBC would have shown the hematocrit to be slightly lower.

Q All right. How much lower, can you quantify?

A Well, the patient still had an open wound. We know he was oozing. The wound was not closed. It would have been too early for him to start

making his own red blood cells to replace blood that was lost. I believe it probably would have been slightly lower.

Q If the H&H had come back slightly lower, if it had fallen again in a third CBC, would it have been appropriate to continue to proceed with the second debridement surgery?

A Absolutely.

Q Tell me what your understanding is of the events leading up to the second debridement surgery, as far as Dr. Ghanma's involvement and who interviewed the patient and *so* forth?

A I don't understand the question.

Q All right. Sorry.

Dr. Ghanma is going to perform the second surgery. And Dr. Quansah is the anesthesiologist, correct?

A Correct.

Q Do you recall whether Dr. Quansah or Dr. Ghanma spoke with the patient immediately prior to the second surgery?

A I don't recall from memory. But I would assume that the anesthesiologist probably spoke with the patient prior to the second surgery.

Q Do you recall if Dr. Ghanma spoke to the patient

immediately prior to the second surgery?

A I don't recall.

Q Do you have an understanding as to what Mr. Porter's blood pressure was immediately prior to the second surgery?

A Yes. From the medical records.

Q Okay. What would that have been, approximately?

A I don't recall the exact numbers, but I believe it was 90 over 60, perhaps.

Q And you have read Dr. Ghanma's second deposition where there was testimony about a blood pressure reading of 67 over 46 before surgery had begun, do you recall that?

MR. TRAVIS: Again, can we refer to a specific part of the deposition, if you are going to make reference to it.

MR. MADDEN: Okay, let's go off the record.

[Discussion had off the record.]

A We are back on the record.

I am looking at Dr. Ghanma's deposition of September 2nd. And I was asked a question by Mr. Madden as to what the patient's blood pressure was on the morning of the 15th. I incorrectly stated that I remembered it to be 90

over 60 and it was actually **110** over 60.

Q Okay.

MR. TRAVIS: Okay. And also --

A Then I was asked by Mr. Madden if Dr. Ghanma had spoken with the patient on the morning of surgery. And in his deposition, page 8, line 9, he stated that he spoke with the patient. And the final question was whether Dr. Ghanma was aware at approximately 9:12 a.m. what the patient's blood pressure reading was and he wasn't and the reading was ***67*** over 46.

Q So we have clarified that. Thank you.

Before proceeding further with the second debridement surgery, as a general proposition, when a patient is proceeding to surgery and he will be under general anesthesia, whose responsibility is it to ascertain whether the patient is suitable for general anesthesia?

A The anesthesiologist.

Q And how does the anesthesiologist go about determining that?

A Based on their review of the records, their history with the patient and any physical examination they perform.

Q And included in a physical examination would be a blood pressure reading?

A Yes.

Q Would the anesthesiologist also review any CBC results of any kind?

A In my experience, they do.

Q If the anesthesiologist was aware of the patient's blood pressure at 67 over 46 prior to commencing surgery, should that patient have gone to surgery?

MR. TRAVIS: Objection. Are you asking him to render an anesthesiology opinion here?

MR. MADDEN: I am asking as a general proposition here.

MR. FOGARTY: I am sorry, what was that?

Q Let's go back to it.

Given Mr. Porter's blood pressure at 67 over 46, was he suitable for general anesthesia?

MR. FOGARTY: At what time? I am sorry, Justin.

MR. MADDEN: At 9:12 am.

MR. TRAVIS: Objection.

MR. FOGARTY: Is that after

the anesthesia was started?

MS. CUTHBERTSON: During induction?

MR. MADDEN: During induction.

MR. TRAVIS: Objection. You can answer if you can, Doctor.

A I am not board certified in anesthesia so I have no way of answering that question.

Q Okay. Should Dr. Ghanma have been made aware of the patient's blood pressure at that time?

MR. FOGARTY: I am sorry, Justin, are you talking about 9:12?

MR. MADDEN: 9:12.

MR. FOGARTY: 67 over 46. And you read from Dr. Ghanma's deposition where he indicated that?

MR. TRAVIS: Right.

MR. FOGARTY: Okay.

MR. TRAVIS: He is not aware of that. Go ahead.

A Right, Dr. Ghanma was not aware of that. That is right. It is a complex question to answer. And I am not trying to avoid it but there are many reasons that a patient's blood pressure may

be significantly low at induction. As to whether to notify the surgeon or not would depend on what the anesthesiologist feels is causing that problem.

Q When you say induction, I want to make sure. I have an idea what it means, but I am not sure what it means. So can you tell me what induction is?

A Speaking as an orthopedic surgeon?

Q Sure, again.

A My, when I say induction it means the start of anesthesia.

Q When the mask is over the patient's face?

A Starting to give the patient medications of any sort, including medications intravenously or through the lungs or injectable of any sort.

Q When a patient is placed under general anesthesia, whose responsibility is it to monitor the patient's vital signs or hemodynamic stability?

A Anesthesia.

Q Who has the responsibility to report or monitor the patient's vital signs or to report that to the surgeon?

A The anesthesiologist.

Q Do you have an opinion whether the anesthesiologist, in this second debridement surgery, properly informed Dr. Ghanma as to the patient's vital signs?

MR. FOGARTY: Objection.

MR. TRAVIS: Objection. You can answer.

A Again, I am not an anesthesiologist. I can't answer it based on that. Because there are many reasons that vital signs will change. And it is necessary to notify the surgeon if the vital signs are changing for some unknown reason and which the surgeon needs to be aware.

Q Okay. What is your understanding as to what occurred in the second debridement procedure, given everything you have reviewed in this case?

A The patient was placed in the prone position. During the procedure Dr. Ghanma was notified that the patient's blood pressure was low and Dr. Ghanma asked if he should stop and he was told he should finish up. He finished up. And as the patient was turned from the prone position to the supine position, the patient had a cardiac arrest.

Q Whose call is it whether the surgery continues

at the point where the question was asked, should we stop, whose call is it to continue, to go forward?

A The anesthesiologist.

Q Was there any particular reason why Dr. Ghanma -- was there something else that Dr. Ghanma had to finish which required him to go forward when the anesthesiologist reported a small problem?

A I don't know that I have material to answer that, other than to say Dr. Ghanma was aware of it and stated he finished up as soon as he could.

Q Okay. I am going to represent to you that Dr. Ghanma testified that, when the question was raised whether to continue, it was his testimony that there wasn't really anything else he really needed to do, so the option was just that, an option. Are you aware of that portion of the testimony?

MR. TRAVIS: I am going to object again. Let's show him the portion of the testimony you are referring to.

MR. MADDEN: Okay, off the record.

[Discussion had of€ the record.]

Q Going back on the record now. I had earlier represented to you, Dr. Ghanma's testimony in his first deposition, that when the question came up whether to stop the procedure Dr. Ghanma testified that he could have stopped at that point if the anesthesiologist had asked him to. Did I summarize that correctly?

A Yes.

Q Okay. But the decision was made by the anesthesiologist to continue the surgery.

MR. TRAVIS: Objection.

MR. FOGARTY: Objection.

Q True?

MR. FOGARTY: That is not really an accurate summary of what you just quoted to the doctor before, about what the anesthesiologist said, but go ahead.

Q You testified earlier whose decision it is whether to stop the surgical procedure?

A Correct.

Q Whose call is it?

A The anesthesiologist.

Q Okay. In this particular debridement surgery, when the question was raised, was there anything

else that Dr. Ghanma needed to do at the point where the question came up?

A He testified in his deposition that he could have finished at that stage but he was told he didn't have to finish at that stage.

Q Do you have any criticisms of continuing that procedure at that point?

MR. FOGARTY: Objection. That is the third time you have asked him.

A Again I can't answer that, not being an anesthesiologist.

Q Was Dr. Ghanma given all of the necessary information at that point, in your opinion?

A At that point the information Dr. Ghanma was given is that he didn't have to finish at that point, so he would take that to mean just what it says.

Q Okay. With everything you have had to review at this point now, was that an accurate report to Dr. Ghanma?

MR. FOGARTY: Objection.

MR. TRAVIS: Objection.

A Again, you would have to ask an anesthesiologist.

Q Why don't you just tell me, in your own words,

why did this patient die?

A I believe this patient died of a combination of sepsis and pulmonary embolism.

Q Can you explain that?

A Yes. I believe he -- I believe based on the facts, that he was septic. I draw that conclusion based on the fact that he had a severe injury to his thigh. That we now had necrosis of muscle was infected with bacteria, including gram negative bacteria, that his blood culture postmortem showed gram negative bacteria and gram positive bacteria in the blood. Clearly that defines sepsis. I believe that at the cardiac arrest, he had signs of right heart obstruction and that, together with the fact that he was a young, healthy patient, with a severe injury to his extremity, means pulmonary embolism to me.

Q Let's talk about the pulmonary embolism for a minute. Was there ever a finding by the coroner of any indication of a pulmonary embolism?

A No.

Q Do you then disagree with something that the coroner did in this case, is it your belief the coroner missed it? What happened to it?

A It is my belief that the coroner missed it.
Q Why would it have gone, how would he miss it?
A I believe that the patient had a large blood clot that was obstructing the right heart. That he was given a chemical agent to dissolve blood clots, called **TPA**. That he underwent an extended period of CPR, various experts have calculated something up to **1500** or more compressions of his chest. And that the clot was pushed further into the pulmonary trunk, meaning vasculature, and that the three slides that were taken at the time of the coroner's autopsy were probably not sufficient to find the blood clot.
Q Before I forget, do you have any criticisms of the resuscitation efforts by the code team in this matter?
A No.
Q In the process of administering **CPR**, ***is*** it your opinion that that is where the liver laceration occurred?
A Yes.
Q **How** is that explained?
A When performing CPR, in order to utilize the heart as a pump mechanism, you must compress the

heart And in order to compress the heart, you must push very firmly over the heart anteriorly And that in the course of doing that, you can injure the liver, which is a solid organ in the right upper quadrant And in fact liver lacerations are known to occur in patients who have had no trauma whatsoever. During CPR

Q Where was this laceration in Mr. Porter?

A Near the falciform ligament

Q Which is posterior, it is on the undersides of the liver; is that right?

A Yes. It is one of the attachments of the liver to the body

Q Do you recall the dimensions of this lacerations?

A Again, the best I can recall, it was approximately 2 inches

Q All right I will represent that there was testimony, given centimeters by two centimeters and it is in the coroner's report does that strike you as being inconsistent?

A To the best of my recollection, given centimeters is two inches.

Q Right Now, is there any kind of time calculation, how much time does it require for a patient to incur sepsis from an infection? By

this point he is in the hospital maybe 48 hours at the most. And your belief is that he had sepsis by that point?

A Yes.

Q Okay. How is that explained?

A I find it easily explainable by the fact that we know as a fact that the patient's blood culture at the time he died grew bacteria, grew gram-negative bacteria and gram-positive cocci, both very significant pus-producing organisms. They were in his blood at the time he died. He also had an infection in his wound, positive cultures, including those gram-negative bacteria. Therefore, sometime from the time the injury occurred and what we know were polluted waters, near a sewage treatment plant, the bacteria which entered his body through this severe laceration, then entered his bloodstream. And as soon as they entered his bloodstream, by definition he is septic.

Q Okay. Septic enough to cause his death independently or in combination with pulmonary embolism?

A I don't know how I can answer that question. Certainly I believe he died from combination of

the two, but you can die from either one of the two.

Q Certainly a pulmonary embolism could do that?

Now, you had also indicated that liver laceration can occur in the process of CPR?

A Yes.

Q Would you agree that liver lacerations occur with relatively high percentage when you have blunt abdominal injuries?

MR. TRAVIS: Objection. Unless you can explain what you mean. You can answer if you can, Doctor.

Q The literature indicates in the cases of blunt abdominal injury, one of the main things you find, as a general matter, are liver lacerations or injuries to the liver?

A As a general matter, injuries to the liver can occur with blunt abdominal trauma.

Q Okay. Is there anything about where this liver laceration occurred that you would say it is just inconsistent with him being injured while he was in Lake Erie?

A No.

Q Given what you know about Mr. Porter's presentation in the emergency room, the injuries

that you believe he had at that time, were his injuries such that you would expect Dr. Porter to have died in this manner?

A I believe Mr. Porter sustained a life-threatening injury. Fortunately in modern medicine, not all patients with life-threatening injuries die. What is the best I can answer that question.

Q Okay. In other words, he was conditioned as a severe critical state patient when he presented, true?

A I am not sure how you define that. I would have not thought he was critical when he presented at the emergency room. I think he had a life-threatening laceration from a propeller. I believe he was stable in fact at the time he was admitted to the hospital.

Q Did his condition improve at all between July 13th and July 14th, in your opinion?

A No. I believe he was only -- I take that back. Yes, in that he had already undergone one procedure early on the 14th, which was necessary. So to that extent he had probably improved. But I think he was stable on admission and stable on the 14th.

Q Is the same true with the 15th?
A On the 15th, I believe he was becoming unstable, with a dropping blood pressure.
Q Do you have an opinion as to why that blood pressure continued to fall through the 15th?
A Yes.
Q And what is that?
A I believe he was septic.
Q If a patient is septic, what sort of symptoms will they exhibit?
A There is a myriad of symptoms. Some patients there is almost no symptoms and some patients can be extremely ill, meaning mentally agitated or marked changes in mental status, delirious, even to asymptomatic, mentally. They can have a high pulse, high temperature or they can have a low temperature. Sepsis, by definition, is pathogens that are pus producing or toxic producing in the bloodstream and it would depend, to a large extent, what type of pathogens are involved and what the patient's immune system is like.
Q During the second debridement you may recall that there was testimony that the endotracheal tube came out of the patient's mouth, at or

about the time that the patient was rolled on to his back. Do you recall that?

A Yes.

MR. TRAVIS: Object. The tube was found out of the mouth at that time. I don't know whether you can say anything beyond that. But with that objection, please continue.

Q We can agree at some point while the patient was under, the endotracheal was out of the mouth, correct?

A Yes.

Q What is your understanding as to why that happened or do you have any understanding as to what occurred?

A Only to the extent that the endotracheal tube was found out of his mouth when they turned him. I don't have an understanding as to how that occurred.

Q Do you have an opinion as to how long the tube was out of his mouth?

A No.

Q Do you have an opinion as to whether the tube being out of the patient's mouth in any way contributed to his death?

A No.

Q Did it compromise his condition at all?

A I don't know. It would depend on how long it was out of his mouth and whether he was being ventilated or whether he was ventilating himself during that time.

Q I am going to assume, and pardon the stupid question, I am going to assume that a tube coming out a patient's mouth during surgery is an unusual incident?

A I believe it came out after his surgery, when they were turning him. But again, as Mr. Travis pointed out, we don't know. We know that it was found out of his mouth. So it occurred sometime during that period.

MR. TRAVIS: Your expert has not made an issue of it, I presume.

Q I am just trying to figure out what your understanding is of that part of the surgery.

Let me ask you another question.

Was the code in this case called timely, in your opinion?

A I don't know. I don't know enough about anesthesia to know what was going on during the orthopedic procedure, as to what the ventilation, cardiac problems are. I don't know

the answer.

Q In your report, your last opinion, your last paragraph on the first page, is fairly straightforward. And if I can describe it, you have qualified that opinion to say from an orthopedic standpoint. And I take it that is because that is the only speciality from which you are speaking on this case?

A That's correct.

Q Are there any other opinions that you hold in this case, that you and I have not discussed?

MR. TRAVIS: Objection. If you ask him a question he will probably have an answer but --

A Whether Mr. Travis likes it or not but -- not that I know of.

Q We have talked about whether you hold criticisms on various portions. Have we discussed any and all criticisms that you hold in this case? In other words, this is my chance to find out what you are going to say at trial. If there is something else that you are going to testify to in this case, this is the time for me to find out about it.

A I agree. And I know that is your job, which you

are doing a nice job at.

None that I can recall, Mr. Madden. We covered most of the criticisms that I can recall.

MR. MADDEN: Okay. Why don't you give me one minute, just to run through some things.

MR. FOGARTY: Justin, do you want me to ask some questions?

MR. MADDEN: I was going to ask if anybody else has anything. Go ahead, touch on things.

EXAMINATION OF RANDALL MARCUS, M.D.

BY MR. FOGARTY:

Q Dr. Marcus, my name is Dennis Fogarty, I represent Dr. Quansah. Just a couple of questions.

The second debridement, as was the first debridement, both involved a procedure called pulse lavage. Do you know what that is? Can you explain that procedure, please?

A Yes. That is a technique that most of us are using for open wounds, including open fractures. It is akin to a water pick that people use in their mouth. And what we do is under pressure,

we water pick, if you will, or pulse lavage with water, with saline or any fluid. Lots of times we'll use an antibiotic fluid to mechanically wash out the wound.

Q Okay. All right. And does it require you to actually -- I mean are you washing the wound internally, in other words, are you breaking the tissue, or is it all just external, around and in the wound itself? Do you understand the question?

A I am not sure I do.

Q Is it possible to break tissue with the lavage?

A Break tissue?

Q Just tear the tissue or lacerate the tissue at all with this lavage?

A Not significantly, no.

Q Okay. All right. The fact that the post mortem blood cultures grew to gram-negative bacteria and also you said the wound itself, the tissue showed necrosis, indicates that we had, at least at the time of the second debridement, a rather advanced infected wound, correct? The infection had advanced substantially, correct?

MR. MADDEN: Objection.

A I think you are perhaps asking two different

things. The fact that the patient had both gram negatives and gram positives in his bloodstream means he was septic.

Q Okay.

A The sepsis, I believe, occurred from the wound.

Q Right. Okay.

A And you asked if that meant his wound was infected?

Q Yes. What does the necrosis, necrotic muscle, say to you?

A That there is dead muscle in the wound.

Q Caused by?

A Probably caused by loss of circulation to that muscle.

Q Okay. These postmortem findings, would that support or indicate even more the necessity of this second debridement procedure?

A Yes.

Q There is no question in your mind that this procedure needed to be done, correct?

A Absolutely.

Q This was the source of the infection that led to the sepsis?

A Yes, as best I can tell.

Q All right. And the best way to treat a sepsis

is to control the source, correct?

A You must debride the wound Furthermore, I believe that wound needs to be debrided in the operating room

Q Okay All right And the postmortem finding further bolsters your opinions regarding that, correct?

A Correct.

Q Okay. I noted that after you reviewed the autopsy findings that you pointed out correctly t at the toxicology failed to reveal the presence of the narcotics that we know had been prescribed during Mr. Porter's hospital stax

What, if anything, does that tell you regarding the accuracy, let's say, the manner in which the autopsy was performed? Does that cast anything in doubt, in terms of the procedures used or the results that came out of the autopsy, in your mind?

MR ..ADDEN: Objection.

A I will answer it the same way I answered it when Mr. Madden asked me that question. It means that the toxicology test was not accurate. Either from the way it was performed, the way it was collected, but it was not accurate

Q Okay. All right. In your report you indicated that the wound itself, and I assume the infection that developed, made this injury a limb-threatening injury, even on admission, would you agree with that?

A I testified that I felt it was a life-threatening injury.

Q Okay. All right. I understand that. That is what I was going to get to next. But the injury itself, even without the sepsis finding, this was a limb-threatening injury, would you agree?

A Yes.

Q With the development of the bacteria -- I am sorry -- the infection, then you know it also became a life-threatening injury, correct?

A One would predict an injury such as this would become infected and therefore it was limb and life threatening for the same reason.

Q Okay. Do you have an opinion whether Mr. Porter would have arrested even with ut this second debridement procedure?

A I don't know.

Q Clearly he was at risk for whatever risks he had for pulmonary embolism that existed even prior to this second debridement, would you agree with

that?

A Yes.

Q Okay. And the risks associated with the sepsis existed more so prior to this second debridement procedure, correct?

A Correct.

Q Okay. So this patient was in trouble prior to this second debridement procedure, correct?

A Correct.

MR. FOGARTY: All right. That is all I have, Doctor. Thanks.

EXAMINATION OF RANDALL MARCUS, M.D.

BY MS. CUTHBERTSON:

Q My name is Pattie Cuthbertson. I have already introduced myself. And I represent St. Joe's Lorain Hospital in this case.

Doctor, one document you weren't provided with was the supplementary affidavit by the plaintiff's expert, Dr. Shapiro. And in that affidavit, which I am not going to show you, I am just going to represent to you that he claims that the nurses failed to report information about the patient's condition to Dr. Ghanma and perhaps other physicians. With that bit of information, do you, after your thorough review

of this medical record, have any criticisms of any of the health care providers at Lorain St. Joe's? And I am talking about employees of the facilities.

MR. MADDEN: Patty, I will just object. And I don't know why you don't want to show him something, then you wanted to ask him, with that information does he have an opinion. But you can do what you want.

MS. CUTHBERTSON: Because maybe I will get that thing struck and we won't need it later on.

A I will agree with Mr. Madden. You are asking me about something I haven't seen and I haven't studied. So you are telling me --

Q Well, then --

A What are you telling me? Are you telling me --

MS. CUTHBERTSON: Let's go off the record a minute.

[Discussion had off the record.]

Q I will identify it for him.

I have just showed you, Doctor, what is an affidavit of Mark Shapiro, the plaintiff's expert, that was attached to a pleading filed in this case.

Based on your review of that affidavit, along with your review of the medical records in this case, I just want to ask you to confirm that you have no criticisms of any of the health care providers employed by St. Joe Lorain Hospital in this case?

MR. MADDEN: Objection.

A I have no criticisms.

Q A couple of other questions.

Are you aware that the post mortem showed that this patient had 1500 cc's of blood in his abdomen? Are you aware of that?

A Yes.

Q Yes? Is that a great deal of blood, given his circumstances and his condition?

A A great deal of blood? 1500 cc's represents approximately 3 units of blood. Is that your question?

Q Is that a great deal of blood? Let me ask it to you different -- you can't answer that question? You can't answer the way it is phrased?

A I can't answer to "a great deal."

Q Why don't you tell me what a great deal is?

A I won't use the term, a great deal of blood.

Q Okay.

A Because if I use that, my colleagues would think that I didn't know what I was talking about. That is medically, that is nothing personal. What are you asking?

Q Should a patient of this age and this condition be able or would you have expected him to survive a blood loss of that degree?

A Absolutely.

MS. CUTHBERTSON: That is all I have.

MR. MADDEN: Off the record.

[Discussion had off the record.]

REEXAMINATION OF RANDALL MARCUS, M.D.

BY MR. MADDEN:

Q These questions raise some follow-up questions that I need to ask.

Mr. Fogarty asked about whether the patient was at risk for pulmonary embolism with this injury. Can you tell me a little more about your answer on that, was he at risk and, if so, to what degree?

A Yes. Any patient that is placed at decreased activity level, that has an injury to the lower extremity, is at increased risk over the general population for pulmonary embolism.

Q Did the care providers take steps, with regards to Mr. Porter, to safeguard against a pulmonary embolism?

A Not that I am aware of.

Q Should Dr. Ghanma have administered any sort of agent, any kind of medication, to safeguard against a pulmonary embolism?

A There is no completely safeguard against pulmonary embolism The problem with this patient is we have a blood loss problem with a large open wound that was contaminated and therefore could not be closed And therefore, I don't know of any significant agent that could have been used to prevent pulmonary embolism at this point in time.

Q Are there exercises or activities with a patient that you would have the nurses or whoever was caring for the patient administer to the patient prior to the second deployment?

MS CHRISTENSON: Objection.

A I know of no exercises, other than trying to mobilize the patient, which they weren't able to do because of the severity of the laceration at this point When I say this point in time, in the last answer, in this answer, meaning on the

13th, 14th or 15th of the hospital stay for this patient.

Q You also told me and told Mr. Fogarty, it is your opinion that the toxicology report for Mr. Porter is not accurate, because it caught the presence of some things but not the presence of others. Did I summarize what your testimony was correctly?

A I felt it wasn't accurate because we know he has had narcotics such as, I believe, Demerol, Valium, Codeine, and it did not pick up any of those.

Q I assume you are not board certified in pathology, right, or toxicology?

A That is true.

Q And so is it a fair question to you, how you could perform a toxicology screen inaccurately? I am just wondering how that can happen.

A I don't know how it can happen. I believe this one was inaccurate.

Q You also testified that you believed this patient was septic because of the presence of various bacterias that were found by the coroner; is that fairly summarized?

A I believe he was septic, because my definition

of suspicion is bacteria or pathogens found in the bloodstream And at the autopsy, the blood culture showed pathogens in the bloodstream

Q Now, when a patient deceases, the bacteria would continue to proliferate in the patient's body; is that true?

A I don't know how long that would be true and I am not an expert in that area.

Q Okay And that is fair, and I respect that And I am not going to keep asking you questions about things that you are not an expert in But would you agree that what the autopsy findings showed with respect to bacteria in the system, would not necessarily be the stage that the bacteria was at the time r. Porter was in the operating suite for the second debridement?

MR TRAWIS: Objection. If you know

A I will answer that by saying there should not be pathogens in the bloodstream and pathogens were found in the blood screen at culture but that is the extent of my knowledge in that area.

MR MADDEN: Fair enough I don't have anything else Thanks for your time

THE WITNESS: Thank you,

gentlemen. Good luck.

MR. TRAVIS: We'll read it.

- - - - -

THE STATE OF _____)
) SS:
COUNTY OF _____)

Before me, a Notary Public in and for said state and county, personally appeared the above-named Randall E. Marcus, M.D., who acknowledged that he did sign the foregoing transcript and that the same is a true and correct transcript of the testimony so given.

IN TESTIMONY WHEREOF, I have hereunto affixed my name and official seal at _____, this _____ day of _____, 1999.

_____
Randall E. Marcus, M.D.

_____
Notary Public

My Commission expires: _____

THE STATE OF OHIO,)
COUNTY OF CUYAHOGA.) SS: **CERTIFICATE**

I, Robert J. Wanous, a Notary Public within and for the State of Ohio, duly commissioned and qualified, do hereby certify that the within-named witness, Randall E. Marcus, M.D., was first duly sworn to testify the truth, the whole truth and nothing but the truth in the cause aforesaid; that the testimony then given by him was by me reduced to stenotypy in the presence of said witness, afterwards transcribed on a computer/printer, and that the foregoing is a true and correct transcript of the testimony so given by him, as aforesaid.

I do further certify that this deposition was taken at the time and place in the foregoing caption specified.

I do further certify that I am not a relative, counsel or attorney of either party, or otherwise interested in the event of this action:

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office at Cleveland, Ohio, on this 22nd day of July 1999.

Robert J. Wanous, Notary Public
within and for the State of Ohio
My Commission expires November 22, 2000.

ERRATA SHEET

Page	Line	

CURRICULUM VITAE

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Professor of Orthopaedic Surgery

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Cleveland, Ohio 44106

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PERSONAL DATA

Date of Birth: February 10, 1950
Marital Status: Widower; (Anne Mulligan Marcus, d. 1997)
Children: Blair Mulligan Marcus (b. 1992)

EDUCATION

The Merairie Park Country Day School, New Orleans, Louisiana - Graduate 1968

Tulane University, New Orleans, Louisiana - B.S. (Magna Cum Laude) with honors in Biochemistry (Phi Beta Kappa) 1972

Louisiana State University School of Medicine. New Orleans, Louisiana - M.D. (Sigma Xi) 1975

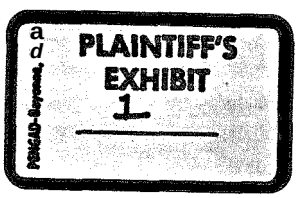
Case Westem Reserve University School of Medicine, Cleveland, Ohio - Rotating Surgical internship 1975 - 1976

Case Western Reserve University School of Medicine, Cleveland, Ohio - Assistant Resident in General Surgery 1976 - 1977

Case Western Reserve University School of Medicine, Cleveland, Ohio - Resident in Orthopaedics 1977 - 1979

Case Western Reserve University School of Medicine, Cleveland, Ohio - Chief Resident in Orthopaedics 1979 - 1980

Oxford University, Oxford, England - Fellow, Nuffield Department of Orthopaedic Surgery 1980 - 1981



University of Basle, Basle, Switzerland - **A. O.** International Fellow, Department of Surgery (Prof. - Dr. M. Allgöwer) 1981

University of Washington, Seattle, Washington - Senior Fellow, Department of Orthopaedics, Harborview Medical Center 1981

ACADEMIC APPOINTMENTS

Post-Doctoral Fellow in Surgery, Case Western Reserve University School of Medicine, 1975 - 1977

Post-Doctoral Fellow in Orthopaedics, Case Western Reserve University School of Medicine, 1977 - 1980

Fellow. Nuffield Department of Orthopaedics, Oxford University, 1980 - 1981

Senior Fellow, Department of Orthopaedics, University of Washington, 1981

Instructor in Orthopaedic Surgery, Case Western Reserve University School of Medicine, 1981 - 1982

Assistant Professor of Orthopaedic Surgery, Case Western Reserve University School of Medicine. 1982 - 1983

Assistant Clinical Professor of Orthopaedic Surgery, Tulane University School of Medicine, 1984 - 1985

Assistant Clinical Professor of Orthopaedic Surgery, Louisiana State University School of Medicine, 1984 - 1985

Assistant Professor of Orthopaedic Surgery, Case Western Reserve University School of Medicine, 1986 - 1991

Director, Division of Foot and Ankle Surgery, Department of Orthopaedics, Case Western Reserve University School of Medicine, 1987

Associate Professor of Orthopaedic Surgery, Case Western Reserve University School of Medicine, 1992-1997

Professor of Orthopaedic Surgery. Case Western Reserve University School of Medicine, 1998-present

HOSPITAL APPOINTMENTS

Attending Orthopaedic Surgeon, University Hospitals, Cleveland, Ohio, 1981 - present

Director, Division of Orthopaedic Trauma, University Hospitals, Cleveland, Ohio, 1981-1983

Consultant Orthopaedic Surgeon, Veterans Administration Hospital, Cleveland, Ohio, 1981 - present

Clinical Chief. Regional Prosthetic Amputee Clinic, Veterans Administration Hospital, 1989 - present

Director, Division of Foot and Ankle Surgery, University Hospitals, Cleveland, Ohio, 1987 - present

BOARD CERTIFICATION

Diplomate, American Board of Orthopaedic Surgeons, 1982
Recertification, American Board of Orthopaedic Surgeons, 1996

LICENSURE TO PRACTICE MEDICINE

Ohio - 1976
Louisiana - 1975

MEMBERSHIP IN PROFESSIONAL SOCIETIES (BY ELECTION)

National and International

Fellow, American College of Surgeons, 1984

Fellow. American Academy of Orthopaedic Surgeons, 1984

orthopaedic Trauma Association, 1986

Societé Internationale De Chirurgie Orthopaedique Et De Traumatologie (SICOT), 1991

American Orthopaedic Foot and Ankle Society, 1992

Association of Bone and Joint Surgeons, 1996

Local

Cleveland Orthopaedic Society, 1981 (Board of Directors 1986 - 1989)

Innominatum Medical Society of Cleveland, 1986
(Board of Directors 1988 - 1993)
(Secretary-Treasurer 1988 - 1990)
(President 1990 - 1991)

Cleveland Aesculapian Medical Society, 1986
(Board of Directors 1991 - 1995)
(President 1993 - 1994)

The Pasteur Club of Cleveland, 1991

NATIONAL APPOINTMENTS AND COMMITTEES

American Board of Orthopaedic Surgeons, Written Examination Committee Question-Writing Task Force, 1983 - Present

American Board of Orthopaedic Surgeons, Written Recertification Examination Question-Writing Task Force, 1991 - 1992

American Board of Orthopaedic Surgeons, Written Recertification Examination Standard Setting **Task** Force - 1996

American Board of Orthopaedic Surgeons, Recertification Examination Adult Reconstruction Question-Writing Task Force, 1996 - present

REGIONAL AND LOCAL APPOINTMENTS AND COMMITTEES

American Red Cross of Northern Ohio - Medical Advisory Board, 1992 - present

Cleveland Health Museum - Board of Directors, 1992 - present

CASE WESTERN RESERVE UNIVERSITY SCHOOL OF MEDICINE AND UNIVERSITY HOSPITALS OF CLEVELAND COMMITTEES

School of Medicine Comprehensive Exam Committee, 1986-1989

University Hospitals Autologous Blood Transfusion Committee (Chairman), 1992 - present

University Hospitals Preadmission Testing Committee, 1994 - present

University Hospitals University Faculty Practice Association Utilization Management Committee, 1995 - present

University Hospitals Observation Unit Committee, 1996 - present

University Hospitals Department of Orthopaedics Credentialing Committee, 1996 - present

EDITORIAL BOARDS AND REVIEWER

Member, Board of Editors, Today in Medicine, New York, N.Y., 1989 - 1995

Editorial Reviewer, The Journal of Bone and Joint Surgery

Editorial Reviewer, The New England Journal of Medicine

Editorial Reviewer, Clinical Orthopaedics and Related Research

UNITED STATES PATENT AWARDS

U.S. Patent 4,622,959: Multi-Use Femoral Intramedullary Nail, November 18, 1986

GRANTS AND FUNDED RESEARCH (Principal Investigator)

1. Metabolic Response of Muscle and Bone to Skeletal Trauma: Effect of Internal Fixation and Early Mobilization
   Robert J. Frackelton Fund $14.000.00 1982-1984

2. Metabolic Response to Trauma
   Orthopaedic Research and Educational Foundation
   $24,000.00 1983-1985

3. Metabolic Response of Muscle and Bone to Skeletal Trauma: Effect of Internal Fixation and Early Mobilization
   Research Fund of 1942 - University Hospitals
   $18,000.00 1986

4. Ceramic Endoprosthesis Implant Study
   Smith & Nephew Richards Grant
   $60.000.00 1990-1993

5. Hematocrit and Coagulation Following Joint Replacement
   OrthoBiotech Grant $2,500.00 1992

6. Open Label Randomized, Parallel Group Study Comparing the Pre-Operative Administration of Epoetin Alpha to the Standard of Care in Blood Conservation (Autologous Predeposit) in Primary Total Knee Reconstruction
   OrthoBiotech Grant $50,000.00 1997-present

BIBLIOGRAPHY

Published Papers

1. Rothschild, H.: Bicker, J.; and Marcus, R.: Regulation of the Beta and Alpha Hemoglobin Genes, Acta Haematologica, Vol. 56, No. 5, 1975.

2. Marcus. R.E.; Albers, W.E.; and Thompson, G.H.: Extruded Osteochondral Nail: Clinical Orthopaedics and Related Research, Vol. 157, pp. 161-163, 1981.

3. Marcus, R.E.: The Orthopaedic Management of the Multiply Injured Child, In Problematic Musculoskeletal Injuries in Children, edited by G. R. Haughton and G. H. Thompson, pp. 193-210. London: Buttenvorths, 1983.

4. Marcus, R.E.; Balourdas, G.M.; and Heiple: K.G.: Ankle Arthrodesis by Chevron Fusion with Internal Fixation and Bone Grafting, The Journal of Bone and Joint Surgery, Vol. 65A, pp.833-838, 1983.

5. Thompson. G.H.: Balourdas, G.M.; and Marcus, R.E.: Railyard Amputations in Children, The Journal of Pediatric Orthopaedics, Vol. 3, pp. 443-448, 1983.

6. Marcus, R.E.; Mills, M.F.; and Thompson, G.H.: Multiple Injury in Children, The Journal of Bone and Joint Surgery, Vol. 65A, pp. 1290-1294, 1983.

7. Smith, A.D.; Carter, J.B.; and Marcus, R.E.: The Os Vesalianum: An Unusual Cause of Lateral Foot Pain, Orthopaedics, Vol. 7, pp. 86-89, 1984.

8. Thompson. G.H.; Wilber, J.H.: and Marcus, R.E.: Internal Fixation of Fractures in Children and Adolescents: A Comparative Analysis. Clinical Orthopaedics and Related Research. Vol. 188. pp. 10-20, 1984.

9. Bargar, W.L.; Marcus, R.E.; and Ittleman, F.P.: Late Thoracic Outlet Syndrome Secondary to Pseudarthrosis of the Clavicle, The Journal of Trauma, Vol. 24, No. 9, pp. 857.859, 1984.

10. Marcus, R.E.: and Hansen, S.T.: Bilateral Fracture-Dislocation of the Sacrum, The Journal of Bone and Joint Surgery, Vol. 66A. pp. 1292-1299, 1984.

11. Marcus, R.E.: Balourdas. G.M.; and Heiple, K.G.: Chevron Ankle Arthrodesis, Orthopaedics/Rheumatology Digest, August, pp. 27-29, 1984.

12. Marcus, R.E; Smith, A.D.; and Carter, J.B.: Treatment of the Os Vesalianum, The Year Book of Podiatric Medicine and Surgery, pp. 1620-1621, 1985.

13. Zdeblick, T.A.; Lederman, M.M.; Jacobs, M.R.; and Marcus, R.E.: Preoperative Use of Providone-Iodine: A Prospective, Randomized Study, Clinical Orthopaedics and Related Research, Vol. 213, pp. 211-215, 1986.

14. Klein, L.; and Marcus, R.E.: Multiple Trauma in Children: Management, Prognosis and Metabolism, Trauma in Children, edited by R.E. Marcus, pp. 1-12, Maryland: Aspen Publishers, 1986.

15. Marcus, R.E.; and Hansen, S.T.: Bilateral Fractures of the Tibia: A Severe Injury Associated with Multiple Trauma, The Journal of Trauma, Vol. 27, No. 4, **pp.** 415-419, 1987.

16. Marcus, R.E.; and Heiple, K.G.; Arthrodesis of the Ankle, Operative Orthopaedics, edited by M.W. Chapman, Philadelphia, J.B. Lippincott, 1988.

17. Goodnough, L.T.; Shaffron, D.; and Marcus, R.E.: The Impact of Preoperative Autologous Blood Donation in Orthopaedic Surgical Practice, Vox Sanguinis, Vol. 59, pp. 65-69, 1990.

18. Goodnough. L.T.; Shaffron, D.; and Marcus, R.E.: Utilization and Effectiveness of Autologous Blood Donation for Arthroplastic Surgery. Journal of Arthroplasty, Vol. 5, pp. 89-94. 1990.

19. Goodnough, L.T.; and Marcus, R.E.: Homologous Blood Transfusion Needs in Elective Orthopaedic Surgery: Potential Role of Erythropoietin Therapy, New England Journal of Medicine, (at the request of the editor) Vol. 322, No. 6, pp. 1158-1159, 1990.

20. Marcus. R.E.; Figgie, H.E.; and Figgie, M.P.: The Shoulder and Elbow, Orthopaedics: Problems in Primary Care, edited by R.E. Marcus, **pp.** 17-42, Los Angeles, P.M.I.C., 1991.

21. Kraay. M.P.; and Marcus, R.E.: The Hip. Orthopaedics: Problems in Primary Care, edited by R.E. Marcus, pp. 109-134, Los Angeles. P.M.I.C., 1991.

22. Marcus, R.E.: The Ankle and Foot, Orthopaedics: Problems in Primary Care, edited by R.E. Marcus, pp. 185-208, Los Angeles, P.M.I.C., 1991.

23. Goodnough. L.T.; and Marcus, R.E.: Blood Transfusion in Elective Orthopaedic Surgery: Issues Related to Informed Consent. Prospectives in Orthopaedic Surgery, Vol. 2, No.2, pp. 104-118. 1991.

24. Goodnough. L.T.; and Marcus, R.E.: Effect of Autologous Blood Donation in Patients Undergoing Elective Spine Surgery, Spine. Vol. 17, No. 2, pp. 172-175, 1992.

25. Marcus, R.E.; Heintz, J.J.: and Pattee, G.A.: Don't Throw Away the Austin Moore, Journal of Arthroplasty, Vol. 7. No. 1, pp. 31-36, 1992.

26. Goodnough, L.T.; Riddell, J.; Verbrugge, D.; and Marcus, R.E.: Blood Transfusions in Hip Fracture Patients: Implications for Blood Conservation Programs, Journal of Orthopaedic Trauma, Vol. 7. No. 1, pp. 47-51, 1993.

27. Marcus. R.E.; and Heiple, K.G.: Arthrodesis of the Ankle and Foot, Operative Orthopaedics, edited by Chapman, Philadelphia, J.B. Lippincott, 2nd edition, 1993.

28. Goodnough, L.T.; Vizmeg, K.; and Marcus, R.E.; Blood Lost and Transfused in Elective Orthopaedic Surgery Patients: Implications for Blood Conservation Programs, Surgery, Gynecology and Obstetrics, Vol. 176, pp. 235-238, 1993.

29. Marcus, R.E.; and Pfister, M.E.: The Enigmatic Diagnosis of Posterior Tibialis Tendon Rupture, The Iowa Orthopaedic Journal, Vol. 13, pp. 171-177, 1993.

30. Marcus. R.E.: The Effect of Erythropoietih on Red Blood Cell Volume in Autologous Blood Donors, Continuing Education in Orthopaedic Surgery, Orthopaedic Audio-Synopsis Foundation, Vol. 25, No. 7, October 1993.

31. Goodnough. L.T.; Verbrugge, D.; Marcus, R.E.; and Goldberg, V.M.: The Effect of Patient Size and Dose of Recombinant Human Erythropoietin Therapy on Red Blood Cell Volume Expansion in Autologous Blood Donors for Elective Orthopaedic Operation, Journal of the American College of Surgeons, Vol. 179, pp. 171-176, 1994.

32. Ziran, B.H.; and Marcus, R.E.: Biologic Fixation of Osteochondritis Dissecans of the Knee, Orthopaedics (International Edition), Vol. 2, No. 6, pp. 527-532, 1994.

33. Goodnough. L.T.; and Marcus, R.E.: The Effect of EPO Therapy on Red Cell Volume Expansion in Autogenous Blood Donors Undergoing Elective Orthopaedic Surgery, Contemporary Orthopaedics, Vol. 29, No 6, pp. 430-434, 1994.

34. Marcus. R.E.; Pfister, M.E.; and Goodfellow. D.G.: The Difficult Diagnosis of Posterior Tibialis Tendon Rupture in Sports Injuries, Orthopaedics. Vol. 18, No. 8, pp. 715-721, 1995

35. Goodnough, L.T.; Verbrugge. D.; and Marcus, R.E.: The Relationship Between Hematocrit, Blood Lost and Blood Transfused in Total Knee Replacement, The American Journal of Knee Surgery. Vol. 8, No. 3. pp. 83-87, 1995.

36. Tisdel. C.L.; Marcus, R.E.; and Heiple, K.G.: Triple Arthrodesis for Diabetic Peritalar Neuroarthropathy, Foot and Ankle International, Vol. 16, No. 6, pp. 332-338, 1995.

37. Yue. J.J.; and Marcus, R.E.: The Role of Internal Fixation in the Treatment of Jones Fractures in Diabetics, Foot and Ankle International, Vol. 17, No. 9, pp. 559-562, 1996.

38. Yue, J.J.; Wilber J.H.; Lipuma. J.P.; Murthi, A.; Carter, J.R.; Marcus, R.E.; and Valentz, R.: Posterior Hip Dislocations: A Cadaveric Angiographic Study, The Journal of Orthopaedic Trauma, Vol. 10, No. 7, **pp.** 447-454, 1996.

39. Victoroff, B.N.; Marcus, R.E.; and Deutsch, **A.:** Arthroscopic Bone Peg Fixation in the Treatment of Osteochondritis Dissecans in the Knee, Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol. 12, No. **4,** pp. 506-509, 1996.

4G. Goodnough, L.T.; and Marcus, R.E.: The Erythropoietic Response to Erythropoietin in Therapy in Patients With Rheumatoid Arthritis, Journal of Laboratory and Clinical Medicine. Vol. 130, pp. 381-386, 1997.

41. Marcus, R.E.: Practical Biomechanics: Intramedullary Fixation Devices. Techniques in Orthopaedics, Vol. 13, No. 1, pp. 1-8, January 1998.

42. Goodnough, L.T.; and Marcus, R.E.: Erythropoiesis in Patients Stimulated with Erythropoietin: The Relevance of Storage Iron. Vox Sanguinis, Vol. 75, pp. 128-133, 1998.

Published Books

1. Trauma in Children, by R.E. Marcus, ed., 288 pages, Maryland: Aspen, 1986.

2. Orthopaedics: Problems in Primary Care, by R. E. Marcus, **400** pages, Los Angeles, P.M.I.C.. 1991.

Visiting Professorships and Invited Lectureships

1. Hospital for Joint Diseases, Department of Orthopaedics, New York University School of Medicine. New York, N.Y., October 1989.

2. University of Cincinnati Medical Center, Department of Orthopaedics, Cincinnati, Ohio, October 1993.

3. Albert Einstein Medical Center, Department of Orthopaedics, Philadelphia, Pennsylvania, October 1993.

4. Louisiana State University School of Medicine, Department of Orthopaedics, New Orleans, Louisiana, Redler Lectureship, November 1994.

5. Nippon University School of Medicine, Department of Orthopaedics, Tokyo, Japan, July 1995.

6. Hirosaki University School of Medicine, Department of Orthopaedics, Hirosaki, Japan, July 1995.

7. Japan Fracture Repair Society, 21st Annual Meeting, Special Guest Lecture, Osaka, Japan, July 1995.

8. International Seminar for Fracture Treatment, Guest Lecturer, Department of Orthopaedic Surgery, Osaka City University Medical School, Osaka, Japan, July 1995.

9. Greenville Medical Center, Department of Orthopaedics, Greenville, South Carolina, November 1995.

10. University of California Irvine, Department of Orthopaedics, Irvine, California, January 1996.

11. Tempie University, Department of Orthopaedics, Philadelphia, Pennsylvania, December 1996.

12. Emory University, Department of Orthopaedics, Atlanta, Georgia, January 1997.

13. Royal College of Physicians and Surgeons of Canada, Guest Speaker, Hospital du Sacré Coeur, Montreal, April 1997.

14. Vanderbilt University, Department of Orthopaedics, Nashville, Tennessee, June 1997.

15. Australian Orthopaedic Association Keynote Speaker, High Energy Trauma Conference. Melbourne, Australia, August 1997.

16. Hennepin County Medical Center Annual Orthopaedic and Trauma Seminar Guest Speaker, Minneapolis, Minnesota, October 1997.

17. Inchon Kil Hospital. Department of Orthopaedics, Inchon, Korea, December 1998.

18. Ewha Women's University, Mokong Hospital, Department of Orthopaedic Surgery, Seoul. Korea. December 1998.

19. Tn-Service General Hospital National Defence Medical Center, Department of Orthopaedics. Taipei, Taiwan, Republic of China, December 1998.

20. Armed Forces Taoyuan General Hospital, Department of Orthopaedic Surgery, Taoyuan. Taiwan. Republic of China, December 1998.

21. Chungshan Medical College. Department of Orthopaedic Surgery, Taichung, Taiwan, Republic of China. December 1998.

22. ChiMei Hospital, Department of Orthopaedic Surgery, Tainan, Taiwan, Republic of China, December 1998.

23. National Police Medical Center, Department of Orthopaedics, Bangkok, Thailand, December 1998.

24. Mahidol University, Siriraj Hospital, Department of Orthopaedic Surgery, Bangkok, Thailand, December 1998.

25. Royal Thai Airforce Hospital, Department of Orthopaedic Surgery, Bangkok, Thailand, December 1998.

26. Lerdsin General Hospital, Department of Orthopaedic Surgery, Bangkok, Thailand, December 1998.

27. All-India Institute of Medical Sciences, Department of Orthopaedics, New Delhi, India, December 1998.

28. Hosmat Hospital, Department of Orthopaedics Trauma Symposium, Bangalore, India, December 1998.

Presentations to Local, National, and International Medical and Scientific Societies

1. The Metabolic Response to Trauma. The Swiss Institute for Surgical Research, Davos, Switzerland, March 1981.

2. Internal Fracture Fixation Techniques. Northeast Ohio Chapter of the National Association of Orthopaedic Nurses, Fall Meeting, Cleveland, Ohio, October 1981.

3. The Relationship of Ketone Metabolism in Traumatic Injury. Grand Rounds, Department of Surgery. Case Western Reserve University School of Medicine, Cleveland, Ohio, December 1981.

4. The Multiply Injured Child of Adolescent: The Case Western Reserve Experience. The Forty-Ninth Annual Meeting of the American Association of Orthopaedic Surgeons, New Orleans. Louisiana. January 1982.

5. The Orthopaedic Management of the Child with Neurologic Injury. The European-American Winter Neurosurgery Conference, Obergurgle, Austria, March 1982.

6. Closed Intramedullary Nailing of the Femur, Orthopaedic Grand Rounds Conference, The Mount Sinai Medical Center, Cleveland. Ohio. May 1982.

7. 1982 Concepts in Fracture Management. "Medicine Today" 1982, Case Western Reserve University School of Medicine. Cleveland, Ohio, May 1982.

8. The Management of Pelvic Fractures. Trauma Update, 1982, Case Western Reserve University School of Medicine, Cleveland, Ohio, May 1982.

9. Faculty - AO/ASIF, Advanced Course on the Operative Treatment of Fractures and Nonunions. sponsored by the Johns Hopkins School of Medicine, Hot Springs, Virginia, April 1983.

10. Railyard Amputations in Children. The Association of Children's Prosthetic and Orthotic Clinics Annual Meeting, Salt Lake City, Utah, May 1983.

11. The Management of Fractures Associated with Vascular Trauma, Trauma Symposium, Case Western Reserve University School of Medicine, Cleveland, Ohio, June 1983.

12. Intramedullary Nailing: Variations on a Theme. Orthopaedic Grand Rounds Conference, Saint Luke's Hospital, Cleveland, Ohio, July 1983.

13. Orthopaedic Methods in Trauma, Radiology Grand Rounds, Case Western Reserve University School of Medicine, Cleveland, Ohio, November 1983.

14. Closed Intramedullary Nailing Techniques, Orthopaedic Grand Rounds, Touro Infirmary, New Orleans, Louisiana, February 1984.

15. Metabolic Response to Trauma in Adults. The European-American Neurosurgical Society, St. Moritz, Switzerland, March 1984.

16. Multiple Injury in Children. Tulane Caldwell Society Annual Meeting, New Orleans. Louisiana, May 1984.

17. Interlocking Intramedullary Nailing Techniques, Trauma Symposium, Sponsored by the Department of Orthopaedics, Case Western Reserve University, Cleveland, Ohio, August 1984.

18. Faculty - AO/ASIF Basic Course on the Operative Treatment of Fractures and Nonunions, Sponsored by the University of South Florida School of Medicine, Pheasant Run Resort, Illinois. September 1984.

19. A.O. Techniques in Fracture Management, Tulane University School of Medicine, Department of Orthopaedics, New Orleans, Louisiana, September 1984.

20. Chevron Ankle Arthrodesis, Louisiana Orthopaedic Association Annual Meeting, New Orleans, Louisiana, October 1984.

21. Pre-Operative User of Providine-Iodine: A Prospective Randomized Study, The Fifty-Second Annual Meeting of the American Academy of Orthopaedic Surgeons, Las Vegas, Nevada, January 1985.

22. Faculty - AO-ASIF Basic Course on the Operative Treatment of Fractures and Nonunions, sponsored by the Swiss Association for the Study of Internal Fixation, Lake Buena Vista, Florida, September 1985.

23. Techniques of Internal Fixation in Fractures and Nonunions, Tulane University School of Medicine, Department of Orthopaedics, New Orleans, Louisiana, October 1985.

24. New Techniques of Closed Intramedullary Nailing, Case Western Reserve University School of Medicine, Orthopaedic Grand Rounds, May 1986.

25. Faculty - AO/ASIF Advanced Course on the Operative Treatment of Fractures and Nonunions. sponsored by the Swiss Association for the Study of Internal Fixation, Davos, Switzerland, December 1986.

26. Closed Lnterlocking Intramedullary Nailing of Long Bone Fractures, Herndon Society Biannual Meeting, Palm Beach, Florida, April 1987.

27. Chevron Technique for Ankle Arthrodesis, International Meeting of the Girdlestone Society. Nuffield Department of Orthopaedic Surgery, Oxford University, Oxford, England, September 1987.

28. MRI - Gadolinium Evaluation of the Lumbar Spine, European American Neurosurgical Society, International Meeting, Vienna, Austria, March 1988.

29. Faculty - AO/ASIF Techniques: Aims, Principles and Instrumentation of AO/ASIF, Cleveland Clinic, Cleveland, Ohio, July 1988.

30. Management of Shoulder Problems, University Hospitals of Cleveland, Department of Physical Therapy Seminar, Cleveland. Ohio, September 1988.

31. Unipolar Femoral Head Replacement Following Fractures, Orthopaedic Trauma Association, Dallas, Texas, October 1988.

32 Comparison of Bipolar and Austin Moore Replacement for Fractured Femoral Necks in the Elderly. Herndon Orthopaedic Society Biannual Meeting, Snowmass, Colorado. April 1989.

33 Unipolar Vs. Bipolar Hip Replacements, Grand Rounds, Hospital for Joint Diseases, Department of Orthopaedics, New York University School of Medicine, New York, N.Y., October 1989.

34. Don't Throw Away the Austin Moore, American Academy of Orthopaedic Surgeons' 57th Annual Meeting, New Orleans, Louisiana, February 1990.

35 Difficult Tibial Shaft Fractures, Zimmer Trauma Course on Upper and Lower Extremity Complex and Difficult Fracture issues. Amelia Island, Florida, December 1990.

36. Intramedullary Nailing of Complex Tibial Fractures, Herndon Orthopaedic Society Biannual Meeting, Montego Bay, Jamaica, January 1991.

37. Erythropoietin in Surgical Anemias, Department of Medicine Postgraduate Course, Case Western Reserve University School of Medicine, Cleveland, Ohio, March 1991.

38. Design and Use of Intramedullary Nails, Michigan Orthopaedic Society, Bloomfield Hills, Michigan, April 1991.

39. Plate Fixation of Fractures: Theory and Technique, Grand Rounds, Department of Orthopaedics. Case Western Reserve University School of Medicine, Cleveland, Ohio, June 1991.

40. Treatment of Hip Fractures, Grand Rounds, Department of Orthopaedics, Case Western Reserve University School of Medicine, Cleveland, Ohio, September 1991.

41. Treatment of Complex Tibia Fractures, Youngstown Orthopaedic Surgeons' Fall Meeting, Youngstown, Ohio, September 1991.

42. Treatment of Fernoral Neck Fractures, Department of Orthopaedics, Ground Rounds, Mt. Sinai Medical Center, Cleveland, Ohio, July 1992.

43. Indications. Techniques and Results of Intramedullary Nailing of Femoral and Tibial Fractures. Maryland Shock Trauma Hospital, Trauma Meeting, Baltimore, Maryland, August 1992.

44. The Use of Intramedullary Fixation for Complex Femoral and Tibial Fracture, Department of Orthopaedic Surgery, Columbia University College of Physicians and Surgeons. Trauma Course. New York, New York, October 1992.

45. Technique and Complications in Intramedullary Nailing of the Femur, Management of Complex Fracrures Course, Richard F. Kyle, M.D., Chairman, Vail, Colorado, January 1993.

46. The Effect of Erythropoietin Therapy in Red Blood Cell Volume Expansion in Autologous Blood Donors Undergoing Elective Orthopaedic Surgery, American Academy of Orthopaedic Surgery, San Francisco, California, February 1993.

47. Complex Femoral and Tibial Nailings. American Osteopathic Academy of Orthopaedics. 33rd Annual Postgraduate Seminar, Scottsdale, Arizona. April 1993.

48. Complications of Femoral Shaft Fractures, San Diego Course in Management of Complex Fractures, San Diego, California, June 1993.

49. Knee Injuries. Evaluation and Treatment, Cleveland Academy of Trial Attorneys, Cleveland. Ohio, September 1993.

50. Hip Fractures. Orthopaedic Grand Rounds. Department of Orthopaedics, Case Western Reserve University, Cleveland, Ohio. October 1993.

51. Complications of Intramedullary Nailing, Orthopaedic Grand Rounds, Department of Orthopaedics, University of Cincinnati, Cincinnati, Ohio, October 1993.

52. Techniques of Intramedullary Nailing, Orthopaedic Grand Rounds, Department of Orthopaedics, The Toledo Hospital, Toledo, Ohio, October 1993.

53. Complications of Intramedullary Nailing, Orthopaedic Grand Rounds, Department of Orthopaedics. Albert Einstein Medical Center, Temple University School of Medicine, Philadelphia, Pennsylvania, October 1993.

54. Technique of Intramedullary Nailing, Course in the Management of Complex Fractures, Problems and Solutions, Robert A. Winguist, M.D., Chairman, Amelia Island, Florida, December 1993.

55. Cementless Total Knee Arthroplasty for Osteoarthritis: A Five to Nine Year Functional and Radiological Outcome Study, Goldberg V.M., Buly R.L. and Marcus R.E., American Academy of Orthopaedic Surgeons' 61st Annual Meeting, New Orleans, Louisiana, February 1994.

56. Treatment of Subtrochanteric Fractures of the Femur, Symposium on New Concepts in Long Bone Fracture Fixation, David Templeman, M.D., Chairman, Houston, Texas, May 1994.

57. The Use of Ceramic Unipolar Arthroplasty in the Treatment of Hip Fractures, The Seventh Irving Redler M.D. Orthopaedic Memorial Lecture Touro Infirmary, New Orleans, Louisiana, November 1994.

58. Complications of Intramedullary Nailing, Orthopaedic Grand Rounds, Louisiana State University School of Medicine, New Orleans, Louisiana, November 1994.

59. Biomechanics of I.M. Nailing, 3rd Annual Management of Complex Fractures Problems and Solutions. Richard F. Kyle, M.D., Chairman, Vail, Colorado, January 1995.

60. Design of Intramedullary Fixation Devices, Zimmer Canada National Meeting, Toronto, Canada. February 1995.

61. Ceramic Unipolar Hip Replacement in the Treatment of Femoral Neck Fractures, Orthopaedic Grand Rounds. St. Luke's Hospital, Cleveland, Ohio, February 1995.

62. Design of a Unipolar Ceramic Hip, Charles Herndon Orthopaedic Society Biannual Meeting, St. Croix, U.S.V.I., March 1995.

63. Biomechanics of I.M. Nails, Cleveland Trauma Update, Randall E. Marcus, M.D., Chairman. Cleveland. Ohio, April 1995.

64. Bone Grafting in Revision Total Hip Surgery, Hip and Knee Revision Seminar, Department of Orthopaedics, University of California. Davis, California, April 1995.

65. Outcome of 100 Consecutive Cementless Femoral Components; Minimal 5-Year Follow-Up, Goldberg, V.M., Kraay, M., Marcus, R.E., 108th Annual Meeting of the American Orthopaedic Association, White Sulphur Springs, West Virginia, June 1995.

66. Results of a Cementless Total Knee Arthroplasty with a Cemented Congruent Patella, Goldberg, V.M., Kraay, M., Marcus, R.E., 108th Annual Meeting of the American Orthopaedic Association, White Sulphur Springs, West Virginia, June 1995.

67. Design and Biomechanics of Intramedullary Fixation Devices, Orthopaedic Grand Rounds. Nippon University Medical Center. Tokyo, Japan, July 1995.

68. Design and Biomechanics of Intramedullary Fixation Devices, Orthopaedic Ground Rounds. Hirosaki University Medical Center, Hirosaki, Japan, July 1995.

69. Treatment of Open Fractures of the Tibia, Special Lecture, The 21st Annual Meeting of the Japan Fracture Society, Osaka, Japan. July 1995.

70. Complications of Intramedullary Nailing of the Femur, International Seminar for Fracture Treatment. Osaka, Japan, July 1995.

71. Technique of Femoral Shaft Intramedullary Nailing and Proximal Femur Reconstructive Nailing. Orthopaedic Trauma Association Residents Fracture Course, Tampa, Florida, September 1995.

72. Biomechanics of Intramedullary Devices, Orthopaedic Grand Rounds, Greenville Memorial Medical Center. Greenville, South Carolina, November 1995.

73. Design and Biomechanics of Intramedullary Fixation Devices, Orthopaedic Grand Rounds, Depanment of Orthopaedics. University of California Irvine, Irvine, California, January 1996

74. Biomechanics of I.M. Nailing, 10th Annual Vail Orthopaedic Symposium, Richard Kyle, M.D., Chairman, Vail, Colorado, January 1996.

75. Clinical Applications and Techniques in the Treatment of Open Tibia Fractures and Biomechanics - Design Considerations of the ZMS Nail System, Trauma Symposium, Division of Orthopaedics, Dalhousie University, Halifax, Nova Scotia, 1996.

76. Complications of Intramedullary Nailing and Intramedullary Fixation Devices - Biomechanics, Trauma Update, University of Southern California, Jackson Lee, M.D., Chairman. Dana Point. California, June 1996.

77 Oxidized Zirconium for Hemiarthroplasty, Orthopaedic Grand Rounds. Case Western Reserve University School of Medicine, Cleveland, Ohio, July 1996.

78 Biomechanics of Intramedullary Nails, Orthopaedic Grand Rounds, St. Luke's Medical Center, Cleveland, Ohio, August 1996.

79. Techniques of Femoral Shaft Nail Fixation, Orthopaedic Trauma Association Residents' Basic Fracture Course, Boston, Massachusetts, September 1996.

80. Reamed vs. Unreamed Nails - Biomechanics, International Trauma Update, Robert Winquist, M.D.. Chairman, Phoenix, Arizona, November 1996.

81. Soft Tissue Management of Open Fractures, Western Reserve Care System Department of Surgery Grand Rounds, Youngstown. Ohio. November 1996.

82. Design and Biomechanics of Intramedullary Nails, Orthopaedic Grand Rounds, Temple University School of Medicine, Philadelphia. Pennsylvania, December 1996.

83. Biomechanics of Intramedullary Fixation Devices, Orthopaedic Grand Rounds, Emory University School of Medicine, Atlanta, Georgia, January 1997.

84. Biomechanics of I.M. Nailing, Trauma Update, 11th Annual Vail Orthopaedic Symposium, Richard Kyle, M.D., Chairman, Vail, Colorado, January 1997.

85. Management of Lower Extremity Trauma and Soft Tissue Injuries; Biomechanics and Design of Intramedullary Fixation Devices; Technique of Reconstructive Intramedullary Nailing; Guest Speaker of the Royal College of Physicians and Surgeons of Canada, "Les Journées de Traumatologie," Hospital du Sacré Coeur, Montreal, Canada, April 1997.

86. Soft Tissue Management in Open Fractures; Indirect Reduction in Fracture Fixation, International Trauma Update, T.A. Russell, M.D., Chairman, Maui, Hawaii, April 1997.

87 Treatment Failure in Femoral Neck Fractures in Patients 80 Years of Age and Older, 49th Annual Meeting of the Association of Bone and Joint Surgeons, Scottsdale, Arizona, May 1997.

88 Indirect Reduction Techniques in Fracture Fixation, Orthopaedic Grand Rounds, Greenville Medical Center. Greenville, South Carolina. May 1997.

89 Biomechanics of Intramedullary Fixation Devices, Department of Orthopaedics, Vanderbilt University School of Medicine, Nashville, Tennessee, June 1997.

90 Biomechanics and Design of Intramedullary Nails, Grand Rounds, Department of Orthopaedics, Case Western Reserve University School of Medicine. Cleveland, Ohio, June 1997.

91 Priorities and Guidelines in Managing the Multiple Trauma Patient; Status of Intramedullary Rods in Acute Trauma in the Femur; Who Deserves Amputation; Talus Fractures and Dislocations. Operative Management, Results and Complications; Australian Orthopaedic Association High Energy Trauma ,Meeting, Melbourne, Australia, July 1997.

92 Biomechanics of Intramedullary Fixation: Complex Fractures of the Distal Femur: Indirect Reduction Techniques; Current Treatment of Talus Fractures; Hennepin County Medical Center Annual Orthopaedic and Trauma Seminar, Minneapolis, Minnesota, October 1997.

93. Percutaneous Pin Fixation of Proximal Humeral Fractures, Orthopaedic Trauma Association Annual Meeting, Louisville, Kentucky, October 1997.

94. Technique of Reconstructive Intramedullary Nailing of the Femur, Orthopaedic Trauma Association Residents' Basic Fracture Course. Louisville. Kentucky. October 1997.

95. Diabetic Charcot Arthropathy, Case Western Reserve University School of Medicine, University Hospitals Multidisciplinary Symposium, Salvaging the Diabetic Foot, Cleveland, Ohio. October 1997.

96. Charcot Foot Deformity, Multidisciplinary Symposium - Salvaging the Diabetic Foot, Sponsored by the Divisions of Endocrinology and Vascular Surgery, University Hospitals of Cleveland and Case Western Reserve University School of Medicine, October 1997.

97. Femoral Fractures in Children; Open Reduction Internal Fixation of Proximal Humeral Fractures; Management of Fractures of the Talus; Trauma Update, 12th Annual Vail Orthopaedic Symposium, Richard Kyle, M.D., Chairman, Vail, Colorado, January 1998.

98. Intramedullary Nailing of the Femur; Instructional Course Lecture (216), American Academy of Orthopaedic Surgeons, 65th Annual Meeting, New Orleans, Louisiana, March 1998.

99. Modified McBride Procedure: Unpredictable Results as Treatment for Hallux Valgus; Outcome Study of Tibiotalar Arthrodesis by the Chevron Fusion Technique; 50th Annual Meeting of the Association of Bone and Joint Surgeons, Aspen, Colorado, June 1998.

100. Ceramic Unipolar Prosthesis for the Treatment of Displaced Femoral Neck Fractures in the Elderly, Annual Meeting of the Girdlestone Orthopaedic Society of Oxford University, Grarz. Austria, August 1998.

101. Hallux Valgus: What Works and What Doesn't, The President's Guest Lecture, Cleveland Orthopaedic Society, Cleveland. Ohio, October 1998.

102. Intramedullary Nailing of Femoral Shaft Fractures, Orthopaedic Trauma Association Residents' Basic Fracture Course, Vancouver, Canada, October 1998.

103. Update Knowledge - Intramedullary Nailing Design and Biomechanics, Inchon Kil Hospital. Department of Orthopaedics, Inchon. Korea, December 1998.

104. Biomechanics of Intramedullary Nailing, Ewha Women's University, Mokong Hospital, Department of Orthopaedic Surgery, Seoul, Korea, December 1998.

105. Biomechanics, Design and Decision-Making in Intramedullary Nailing of the Femur, Tri-Service General Hospital National Defence Medical Center, Department of Orthopaedics, Taipei, Taiwan, Republic of China, December 1998.

106. Biomechanics of Intramedullary Nailing, Armed Forces Taoyuan General Hospital, Department of Orthopaedic Surgery, Taoyuan, Taiwan Republic of China, December 1998.

107. Soft Tissue Management of Open Fractures, Chungshan Medical College, Department of Orthopaedic Surgery, Taichung, Taiwan, Republic of China, December 1998.

108. Biomechanics and Technique of Intramedullary Fixation, ChiMei Hospital, Department of Orthopaedic Surgery, Tainan, Taiwan, Republic of China, December 1998.

109. Complications, Design and Technique of Intramedullary Nailing, National Police Medical Center, Department of Orthopaedics, Bangkok, Thailand, December 1998.

110. Biomechanics and Design of Intramedullary Fixation Devices, Mahidol University, Siriraj Hospital, Department of Orthopaedic Surgery, Bangkok, Thailand, December 1998.

111. Biomechanics - Knowledge Update, Intramedullary Nailing, Royal Thai Airforce Hospital, Department of Orthopaedic Surgery, Bangkok, Thailand, December 1998.

112. Techniques for Extraction of Broken Intramedullary Nails, Lerdsin General Hospital, Department of Orthopaedic Surgery, Bangkok, Thailand, December 1998.

113. Biomechanics and Design of Intramedullary Nails; Indirect Reduction Techniques for Intra-Articular Fractures, All-India Institute of Medical Sciences, Department of Orthopaedics, New Delhi, India, December 1998.

114. Complications and Pitfalls of Intramedullary Nailing of the Femur, Hosmat Hospital, Department of orthopaedics Trauma Symposium, Bangalore, India, December 1998.

115. Lisfranc Dislocations; Biomechanics of Intramedullary Rods; Indirect Reduction of the Femur; Trauma Update, 13th Annual Vail Orthopaedic Symposium, Richard Kyle, MD, Chairman. Vail. Colorado, January 1999.

116. Clavicle Fractures - Classification and Complications; Fractures of Both Bones of the Forearm: Upper Extremity: Problem Fractures and Reconstructive Challenges, Thomas Varecka, MD, Chairman, Vail. Colorado, January 1999.

TEACHING AWARDS

Case Western Reserve University Department of Medicine Ambulatory Medicine Teaching Excellence Award, 1996-1997